National Earthquake Prediction Evaluation Council Charge to an

## Independent Expert Panel on New Madrid Seismic Zone Earthquake Hazard

Although the New Madrid Seismic Zone (NMSZ) lies well within the interior of the North American tectonic plate, hundreds of miles from the nearest plate boundary, it has been the most seismically active area within the Central and Eastern US. In addition to ongoing small- and moderate-magnitude earthquake activity, the NMSZ experienced a three-month sequence of earthquakes during the winter of 1811-1812 that are among the largest on-land earthquakes in US history. The geologic record from the region shows that large earthquakes have occurred before 1811 at least twice within the prior 1,200 years. The U.S. Geological Survey (USGS) National Seismic Hazard Maps, which underlie seismic provisions in the latest model building codes, include a region of elevated shaking hazard surrounding the NMSZ. Due to the low seismic attenuation of the mid-continent, even moderate-magnitude earthquakes will cause strong shaking and damage over a much broader area than similar earthquakes striking the plate-boundary regions of the Western US.

Despite these facts, there are substantial uncertainties regarding the size, location and frequency of both past and future earthquakes in the region, and regarding the underlying causes of earthquakes in this intraplate setting. Consequently, there has been debate in scientific and engineering circles on the level of earthquake hazard in the NMSZ.

The upcoming bicentennial of the New Madrid earthquakes will focus attention on the seismic hazards of the region and will provide a unique opportunity to raise public awareness of earthquake hazards and appropriate preparedness activities. At the same time, it brings increased scrutiny of the USGS statutory responsibility to characterize the seismic hazard of the US as it undertakes revision of the National Seismic Hazard Maps beginning in late 2011. For that reason, NEPEC is exercising its responsibility to advise the USGS Director on issues bearing on earthquake forecasting by convening a panel of independent experts to comment on the level of hazard posed by future large earthquakes in the NMSZ. Topics of particular interest include paleoseismologic records of prior large earthquakes in the central US, main-shock magnitudes of the 1811-12 sequence, the nature and implications of ongoing seismicity in the NMSZ, and implications of geodetic observations. Comment is also invited on priorities for future research to better constrain the hazard in light of major sources of uncertainty.

The panel is asked to transmit its written report to NEPEC by April 4, 2011.

### Panel Members:

John Vidale (U. Wash.), chair
Gail Atkinson (U. Western Ont.)
Russell Green (Virginia Tech.)
Eric Hetland (U. Mich.)
Lisa Grant Ludwig (UC Irvine)
Stephane Mazzotti (GSC)
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Lynn Sykes (LDEO)